

WHAT IS CLAIMED IS:

1. A bonding pad structure, comprising:

a substrate;

a bonding pad layer above the substrate;

5 a current conduction structure between the bonding pad layer and the substrate for connecting the bonding pad layer and the substrate electrically, wherein the current conduction structure includes:

a plurality of conductive metallic layers, wherein each conductive metallic layer is at a different height level from the substrate; and

10 a plurality of conductive plugs for linking neighboring conductive metallic layers and the conductive metallic layers with the bonding pad layer and the substrate;

a mechanical support structure between the bonding pad layer and the substrate, wherein the mechanical support structure includes:

15 a plurality of support metallic layers, wherein each support metallic layer is at a different height level from the substrate; and

a plurality of support plugs for linking up neighboring support metallic layers and the support metallic layers with the bonding pad layer and the substrate; and

20 an insulation layer between the bonding pad layer, the current conduction structure, the mechanical support structure and the substrate for isolating the current conduction structure from the mechanical support structure.

2. The bonding pad structure of claim 1, wherein each conductive metallic layer in the current conduction structure has a smaller cross-sectional area than each support metallic layer in the mechanical support structure.

3. The bonding pad structure of claim 1, wherein number of conductive metallic layers in the current conduction structure and number of support metallic layers in the mechanical support structure are identical.

4. The bonding pad structure of claim 1, wherein each conductive metallic layer in
5 the current conduction structure and a corresponding support metallic layer in the mechanical support structure are at an identical height level.

5. The bonding pad structure of claim 1, wherein number of conductive metallic layers in the current conduction structure differs from number of support metallic layers in the mechanical support structure.

10 6. The bonding pad structure of claim 1, wherein the conductive plugs between neighboring conductive metallic layers, the conductive plugs between the conductive metallic layer and the bonding pad and the conductive plugs between the conductive metallic layer and the substrate are evenly distributed.

15 7. The bonding pad structure of claim 1, wherein the support plugs between neighboring support metallic layers, the support plugs between the support metallic layer and the bonding pad and the support plugs between the support metallic layer and the substrate are evenly distributed.

8. A bonding pad structure, comprising:

a substrate;

20 a bonding pad layer above the substrate;

a current conduction structure between the bonding pad layer and the substrate for connecting the bonding pad layer and the substrate electrically, wherein the current conduction structure includes:

a plurality of conductive metallic layer, wherein each conductive metallic layer is at a different height level from the substrate and one of the conductive metallic layers is in direct contact with the substrate; and

a plurality of conductive plugs for linking neighboring conductive metallic layers
5 and linking one of the conductive metallic layers with the bonding pad layer;

a mechanical support structure between the bonding pad layer and the substrate, wherein the mechanical support structure includes:

a plurality of support metallic layers, wherein each support metallic layer is at a different height level from the substrate and one of the support metallic layers is in direct
10 contact with the substrate; and

a plurality of support plugs for linking neighboring support metallic layers and linking one of the support metallic layers with the bonding pad layer; and

an insulation layer between the bonding pad layer, the current conduction structure, the mechanical support structure and the substrate for isolating the current
15 conduction structure from the mechanical support structure.

9. The bonding pad structure of claim 8, wherein a cross-sectional area of each conductive metallic layer in the current conduction structure differs from a cross-sectional area of each support metallic layer in the mechanical support structure.

10. The bonding pad structure of claim 8, wherein each conductive metallic layer
20 in the current conduction structure and each support metallic layer in the mechanical support structure has an identical cross-sectional area.

11. The bonding pad structure of claim 8, wherein number of conductive metallic layers in the current conduction structure and number of support metallic layers in the mechanical support structure are identical.

12. The bonding pad structure of claim 8, wherein each conductive metallic layer in the current conduction structure and a corresponding support metallic layer in the mechanical support structure are at an identical height level.

13. The bonding pad structure of claim 8, wherein number of conductive metallic
5 layers in the current conduction structure differs from number of support metallic layers in the mechanical support structure.

14. The bonding pad structure of claim 8, wherein the conductive plugs between neighboring conductive metallic layers and the conductive plugs between the conductive metallic layer and the bonding pad are evenly distributed.

10 15. The bonding pad structure of claim 8, wherein the support plugs between neighboring support metallic layers and the support plugs between the support metallic layer and the bonding pad are evenly distributed.